# CLAIMS

What is claimed is:

1. An aqueous decontamination formulation for use in disinfection and sterilization, said formulation comprising:

a reactive compound selected from the group consisting of nucleophilic compounds and oxidizing compounds;

a bleaching activator;

an inorganic base; and

water.

2. The formulation of claim 1, comprising (by weight percentage):

0.5-60 % reactive compound;

1-10 % bleaching activator;

3-30% inorganic base;

0-5% cationic surfactant;

0-10% ethanol;

0-20 % freeze-point depressant; and

water (remainder).

3. The formulation of claim 2, wherein:

said reactive compound comprises hydrogen peroxide;

said bleaching activator comprises glycerol diacetate or propylene glycol diacetate;

said inorganic base comprises potassium acetate;

said cationic surfactant comprises benzalkonium chloride; and

said freeze-point depressant comprises propylene glycol.

4. The formulation of claim 1, further comprising one or more sorbent additives selected from the group consisting of sodium carbonate, sodium bicarbonate, potassium carbonate, potassium bicarbonate, calcium carbonate, potassium silicate, precipitated silicates, percarbonates, amorphous silica, fumed silica, sodium citrate, dendritic salt (sea salt), citric acid, polyethylene glycol, PEG 8000, urea, and polyols.

5. The formulation of claim 4, wherein said sorbent additive comprises one or more polyol compounds selected from the group consisting of sorbitol, mannitol, hydrogenated starch hydrolysates (HSH), maltitol, zylitol, lactitol monohydrate, anhydrous isomalt, erythritol, and polydextrose.

6. An aqueous decontamination formulation for use in neutralization of a toxant, said formulation comprising (by weight percentage):

0.5-60 % hydrogen peroxide;
1-10 % glycerol diacetate or propylene glycol diacetate;
3-10% potassium carbonate;
0-10% ethanol; and
water (remainder); wherein said formulation comprises no amount of a cationic surfactant.

7. An aqueous decontamination formulation for use in neutralization of a toxant, said formulation comprising (by weight percentage):

0.5-60 % hydrogen peroxide;
1-10 % glycerol diacetate or propylene glycol diacetate;
0-5% benzalkonium chloride;
5-30% potassium acetate;
0-20% proplyene glycol; and

water (remainder); wherein said formulation comprises no amount of a carbonate salt.

8. A decontamination kit system comprising two components, that when mixed together, make an aqueous decontamination formulation for use in disinfection and sterilization, said kit system comprising:

a first premixed, organic component, Part A, comprising a bleaching activator; and

a second premixed, inorganic component, Part B, comprising:

a reactive compound selected from the group consisting of nucleophilic compounds and oxidizing compounds;

an inorganic base; and

water.

9. The kit system of claim 8, wherein said reactive compound in Part B comprises one or more compounds selected from the group consisting of peroxide compounds, activated peroxide compounds, hydrogen peroxide, urea hydrogen peroxide, hydroperoxycarbonate, sodium perborate, sodium percarbonate, sodium carbonate perhydrate, sodium peroxysilicate, sodium peroxypyrophosphate, sodium peroxysilicate, sodium peroxysilicatehydrogen, peroxide adducts of pyrophosphates, citrates, sodium sulfate, urea, sodium silicate, peracetic acid, oximates, butane-2,3-dione, monooximate ion, benzohydroxamate, alkoxides, methoxide, ethoxide, aryloxides, aryl substituted benzenesulfonates, aldehydes, glutaraldehyde, peroxymonosulfate, Fenton's reagent, and sodium hypochlorite.

10. The kit system according to claim 8, wherein Part A further comprises a solubilizing compound.

11. The kit system according to claim 10, wherein said solubilizing compound comprises a cationic surfactant comprising one or more quaternary ammonium salts selected from the group consisting of cetyltrimethyl ammonium bromide, benzalkonium chloride, benzethonium chloride, cetylpyridinium chloride, alkyldimethylbenzylammonium salt, tetrabutyl ammonium bromide, polymeric quaternary compounds, and benzyl (C12-C16) alkyldimethylammonium chlorides.

12. The kit system according to claim 10, wherein said solubilizing compound comprises ethanol.

13. The kit system according to claim 10, wherein said solubilizing compound comprises a cationic hydrotrope comprising one or more compounds selected from the group consisting of tetrapentyl ammonium bromide, triacetyl methyl ammonium bromide, tetrabutyl ammonium bromide, and pentamethyltallow alkyltrimethylenediammonium dichloride.

14. The kit system according to claim 8, wherein Part A further comprises one or more water-soluble polymers selected from the group consisting of polyvinyl alcohol, guar gum, polydiallyl dimethyl ammonium chloride, polyacrylamide, glycerol, poly(ethylene oxide), poly(ethylene glycol), polyethylene glycol 8000, guar gum 2-hydroxypropyl ether, polyquaternium compounds, and poly-ethoxylated glycerine.

15. The kit system according to claim 8, wherein Part A further comprises one or more solvents selected from the group consisting of di(propylene glycol) methyl ether, diethylene glycol monobutyl ether, hexylene glycol, N,N-dimethlyethylamine, isobutanol, and isopropanol.

16. The kit system according to claim 8, wherein said inorganic base comprises one or more compounds selected from the group consisting of potassium carbonate, potassium bicarbonate, potassium hydroxide, potassium sulfate, potassium phosphate (dibasic or tribasic), potassium borate, potassium tetraborate, potassium acetate, sodium carbonate, sodium bicarbonate, sodium hydroxide, sodium sulfate, sodium phosphate (dibasic or tribasic), sodium borate, sodium acetate, ammonium carbonate, ammonium bicarbonate, ammonium hydroxide, ammonium sulfate, ammonium phosphate (dibasic or tribasic), ammonium borate, ammonium acetate, calcium carbonate, calcium bicarbonate, calcium hydroxide, calcium sulfate, calcium phosphate (dibasic or tribasic), calcium borate, calcium acetate, magnesium carbonate, magnesium bicarbonate, magnesium hydroxide, magnesium sulfate, magnesium phosphate (dibasic or tribasic), magnesium borate, magnesium acetate, sodium percarbonate, ammonium hydrogen bicarbonate and lithium bicarbonate.

17. The kit system according to claim 8, wherein said bleaching activator comprises one or more water-soluble bleaching activators selected from the group consisting of short-chained organic compounds that contain an ester bond, ethylene glycol diacetate, propylene glycol monomethyl ether acetate, methyl acetate, dimethyl glutarate, diethylene glycol monoethyl ether acetate, glycerol acetate (monoacetin), glycerol diacetate (diacetin), glycerol triacetate (triacetin), acetylcholine chloride, 4-cyanobenzoic acid, propylene glycol diacetate, and nitrile group activators.

18. The kit system according to claim 8, wherein said bleaching activator comprises one or more water-insoluble bleaching activators selected from the group consisting of tetraacetyl ethylenediamine (TAED), n-nonanoyloxybenzenesulfonate (NOBS), and N-acetyl pentaacetate.

19. The kit system according to claim 8, wherein Part A further comprises one or more corrosion inhibitors selected from the group consisting of N,N-dimethyl ethanolamine, triethanolamine, ethanolamine salts of C9, C10, and C12 diacid mixtures, dicyclohexyl amine nitrite, and N,N-dibenzylamine.

20. The kit system according to claim 8, wherein Part A further comprises a fatty alcohol comprising one or more compounds selected from the group consisting of 1-dodecanol, 1-tridecanol, hexadecanol, and 1-tetradecanol.

21. The kit system according to claim 8, wherein Part A further comprises a freeze point depressant comprising propylene glycol or potassium acetate.

22. The kit system of claim 8, further comprising no amount of a cationic surfactant.

23. The kit system of claim 8, further comprising no amount of benzalkonium chloride.

24. The kit system of claim 8, further comprising no amount of a carbonate salt.

25. The kit system of claim 8, wherein for every 100 grams of aqueous decontamination formulation made-up after mixing Parts A and B, then

Part A comprises:

1-10 grams of a bleaching activator;
0-4 grams of a cationic surfactant;
0-2 grams of a cationic hydrotrope;
0-20 grams of a freeze-point depressant;
0-0.6 grams of a fatty alcohol;
0-2 grams of a solvent;
0-6 grams of a water-soluble polymer;

0-6 grams of an organic base; and

Part B comprises:

3-70 grams of 8% hydrogen peroxide solution;

5-20 grams of an inorganic base; and

sufficient water to make up 100 grams of total decontamination formulation.

26. The kit system of claim 25, wherein:

said bleaching activator comprises glycerol diacetate or propylene glycol diacetate;

said cationic surfactant comprises benzalkonium chloride;

said inorganic base comprises potassium acetate;

said freeze-point depressant comprises propylene glycol or potassium acetate;

said fatty alcohol comprises 1-dodecanol;

said solvent comprises diethylene glycol monobutyl ether and isobutanol;

said water-soluble polymer comprises poly-ethoxylated glycerine;

said organic base comprises triethanolamine; and

said inorganic base comprises potassium acetate.

27. The kit system of claim 8, further comprising one or more sorbent additives selected from the group consisting of sodium carbonate, sodium bicarbonate, potassium carbonate, potassium bicarbonate, calcium carbonate, potassium silicate, precipitated silicates, percarbonates, amorphous silica, fumed silica, sodium citrate, dendritic salt (sea salt), citric acid, polyethylene glycol, PEG 8000, urea, and polyols.

28. The kit system of claim 27, wherein said sorbent additive comprises one or more polyol compounds selected from the group consisting of sorbitol, mannitol,

hydrogenated starch hydrolysates (HSH), maltitol, zylitol, lactitol monohydrate, anhydrous isomalt, erythritol, and polydextrose.